In the Drawing

Fig. 4 has been amended as shown on the marked-up-in-red sheet of drawing enclosed herewith. Revised formal drawing has also been enclosed.

In the Claims

Please amend the claims as follows:

SUB F1

24. A method of forming a refractory metal silicide layer comprising:

forming a titanium metal layer over a silicon containing substrate;

providing compressive stress inducing atoms into the titanium metal layer, the compressive stress inducing atoms being larger than silicon atoms;

after the providing, first annealing the titanium metal layer containing the compressive stress inducing atoms to form a titanium silicide layer substantially of a first crystalline phase; and

second annealing the titanium silicide layer substantially of the first crystalline phase under conditions effective to transform said titanium silicide layer to a more dense layer substantially of a second crystalline phase.

45. A method of forming a refractory metal silicide comprising:

forming a compressive stress inducing material layer over a first side of a substrate;

forming a refractory metal silicide over the compressive stress inducing material layer, the refractory metal silicide comprising a first crystalline phase; and

after forming the refractory metal silicide comprising a first crystalline phase, annealing the refractory metal comprising a first crystalline phase to form a refractory metal silicide of a second crystalline phase.

52. The method of Claim 24, where the first crystalline phase is C49 and the second crystalline phase is C54.

53. The method of Claim 24, where the compressive stress inducing atoms comprise germanium atoms.

54. The method of Claim 24, where the first crystalline phase is C49, the second crystalline phase is C54 and the compressive stress inducing atoms comprise germanium atoms.

55. The method of Claim 45, where the first crystalline phase is C49 and the second crystalline phase is C54.

56. The method of Claim 45, where the compressive stress inducing material layer comprises silicon oxide or silicon nitride.

57. The method of Claim 45, where the refractory metal silicide comprises titanium silicide.

58. The method of Claim 57, where the first crystalline phase is C49 and the second crystalline phase is C54.

59. (Amended) A method of forming a refractory metal silicide layer comprising:

forming a titanium metal layer over a silicon containing substrate;

providing compressive stress inducing atoms comprising germanium into the titanium metal layer;

first annealing the titanium metal layer containing the compressive stress inducing atoms to form a titanium silicide layer substantially comprising a first crystalline phase after providing compressive stress inducing atoms; and

second annealing the titanium silicide layer substantially comprising the first crystalline phase under conditions effective to transform the titanium silicide layer to a denser layer substantially comprising a second crystalline phase.

60. The method of claim 59, wherein first annealing comprises first annealing the titanium metal layer to form C49 crystalline phase.

61. The method of claim 59, wherein second annealing comprises second annealing the first crystalline phase to form C54 second crystalline phase.

62. (Amended) A method of forming a refractory metal silicide comprising:

forming a refractory metal silicide over a first side of a substrate, the refractory metal silicide comprising a first crystalline phase;

providing stress inducing atoms comprising germanium into the refractory metal silicide;

forming a compressive stress inducing material layer over the refractory metal silicide; and

subsequently annealing the refractory metal silicide comprising the first crystalline phase to convert the first crystalline phase to a second crystalline phase.

E3 SUB F1 (Contd)

63. (Amended) The method of claim 62, wherein forming the compressive stress inducing material layer comprises forming the compressive stress inducing material layer over the first side of the substrate and wherein the substrate comprises a silicon containing substrate.

64. The method of claim 62, wherein forming the refractory metal silicide comprises forming the refractory metal silicide to have a first temperature coefficient of expansion and wherein forming the compressive stress inducing material layer comprises forming the compressive stress inducing material layer to have a second temperature coefficient of expansion that is less than the first temperature coefficient of expansion.

65. The method of claim 62, wherein forming the refractory metal silicide comprises forming titanium silicide comprising C49 crystalline phase and wherein annealing the refractory metal silicide comprises forming C54 crystalline phase.

66. (Amended) A method of forming a refractory metal silicide comprising:

forming a refractory metal silicide over a first side of a substrate, the refractory metal silicide comprising a first crystalline phase;

disposing stress inducing material operationally coupled to the refractory metal silicide, disposing including introducing stress inducing atoms into the refractory metal silicide; and

subsequently annealing the refractory metal silicide comprising a first crystalline phase to convert the first crystalline phase to a second crystalline phase.

67. The method of claim 66, wherein disposing stress inducing material comprises forming a layer of material configured to induce a compressive stress in the refractory metal silicide over a second side of the substrate, wherein the second side is opposed to the first side.

68. The method of claim 66, wherein disposing stress inducing material comprises forming a compressive stress inducing material layer over the refractory metal silicide.

69. The method of claim 66, wherein introducing stress inducing atoms comprises introducing germanium into the refractory metal silicide

70. The method of claim 66, wherein forming a refractory metal silicide comprises forming titanium silicide.

SUB F1

New Claims

71. A method of forming a refractory metal silicide comprising:

forming a compressive stress inducing material layer over a first side of a substrate;

forming a refractory metal silicide on the compressive stress inducing material layer, the refractory metal silicide comprising a first crystalline phase; and

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after forming the refractory metal silicide comprising a first crystalline phase, annealing the compressive stress inducing material layer and the refractory metal comprising a first crystalline phase to form a refractory metal silicide of a second crystalline phase.

72. The method of claim 71, wherein forming a compressive stress inducing material layer comprises forming a layer comprising materials chosen from a group consisting of silicon nitride and silicon dioxide.

73. The method of claim 71, wherein forming a refractory metal silicide comprises forming titanium silicide.

74. The method of claim 71, wherein forming the compressive stress inducing material layer is configured to permit the annealing to convert the first crystalline phase to the second crystalline phase via a 20 second anneal in an inert atmosphere at a temperature of about 600 °C.

75. A method of forming a refractory metal silicide comprising:

forming a compressive stress inducing material layer on a first side of a substrate;

forming a refractory metal silicide on the compressive stress inducing material layer, the refractory metal silicide comprising a first crystalline phase; and

after forming the refractory metal silicide comprising a first crystalline phase, annealing the refractory metal comprising a first crystalline phase to form a refractory metal silicide of a second crystalline phase, wherein the compressive stress inducing material layer is configured to permit the annealing to convert the first crystalline phase to the second crystalline phase via a 20 second anneal in an inert atmosphere at a temperature of about 600 °C.

76. The method of claim 75, where the refractory metal silicide comprises titanium silicide, the first crystalline phase is C49 and the second crystalline phase is C54.

77. A method of forming a refractory metal silicide comprising:

forming a refractory metal silicide over a first side of a substrate, the refractory metal silicide comprising a first crystalline phase;

providing compressive stress inducing atoms comprising germanium into the refractory metal silicide;

forming a compressive stress inducing material layer over the refractory metal silicide; and

subsequently annealing the refractory metal silicide comprising the first crystalline phase to convert the first crystalline phase to a second crystalline phase, wherein the compressive stress inducing atoms and the compressive stress inducing material layer are configured to cooperate to permit the annealing to convert the first crystalline phase to the second crystalline phase via a 20 second anneal in an inert atmosphere at a temperature of about 600 °C.

78. The method of claim 77, where the refractory metal silicide comprises titanium silicide, the first crystalline phase is C49 and the second crystalline phase is C54.